"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Individual Contest

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by <u>all</u> involved. Bad sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise:*
    - *For problems dealing with money, a decimal answer should be given.*
    - *Express all rational, non-integer answers as reduced common fractions.*
- *For fifth and sixth grade, all fractions and ratios must be reduced.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on and do NOT include 0.*
- *Units are not necessary unless it is a problem that deals with time and, in that case, am or pm is needed. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of π where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information filled out at the top of the sheet.*
- *Tests will be scored as a 0 if answers are not recorded correctly on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will also be scored as a 0.*
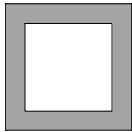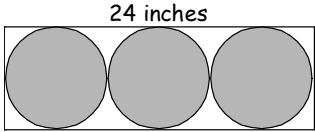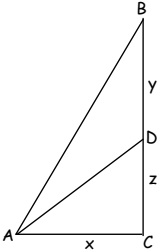
INDIVIDUAL TEST - *35 minutes*

When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. Each problem is scored as a 1 or 0. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute warning.

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Individual Contest

Record all answers on the colored cover sheet.

1	What is the product of the digits of the year 2010?
2	How many lines of symmetry does a scalene triangle have?
3	When 7 is added to 18, the sum is how much less than 30?
4	What time is it 49 minutes before 6:28 PM?
5	Two congruent equilateral triangles are put together exactly side to side without overlap. Give the letter or letters of all the terms below that do not describe the resulting figure. (A) quadrilateral, (B) polygon, (C) rectangle, (D) parallelogram, E) rhombus
6	Evaluate: $100 + 200 + 300 + 500 + 600$.
7	On the planet Threa, the year is divided into 12 months, each with exactly 31 days. How many days are in a year on the planet Threa?
8	If three pencils cost 51¢ in all and each pencil costs the same amount, how many cents would two pencils cost?
9	How many prime numbers are greater than 10 and less than 30?
10	Find the value of $3.09 + 0.034 - 1.26$, and give your answer as a decimal.
11	Rita has a piece of red rope candy that is 72 cm long. She marks 8 different places on the rope, then cuts through the rope at each of these places. On average, what is the length (in cm) of each resulting piece?
12	How many multiples of 5 are between 29 and 72?
13	Adam has 10 coins which have a total value of 78 cents. How many dimes could Adam have? If there is more than one possible answer, give all of them.
14	Four rectangular wooden pieces, each measuring 1 cm wide by 9 cm long, are arranged with no overlap to form a square picture frame, as shown (not to scale). What is the area, in square centimeters, of the largest picture that can fit completely within this frame?
15	The base angles of an isosceles triangle measure 15°. What is the degree measure of the vertex angle of this triangle?
16	Find the volume, in cubic units, of a square pyramid for which the height and the side length of the base are 6 units.
17	Find the value of $4(3+x)-2(7-x)$ if $x = -8$.
18	Water is trickling from a faucet at a rate of 2 milliliters per minute. If Betty holds an empty glass under the faucet, how many <u>liters</u> of water will she collect in 750 seconds? If your answer is not a

	whole number, give it as a decimal.
19	At Bert's Burger Barn, you can choose from white, whole wheat, or sesame seed buns, and from beef, chicken, or veggie patties. If a burger consists of one type of bun and either one patty or two patties (either the same type or different types), how many different burgers can you choose? (The order in which two patties are placed on the bun doesn't matter.)
20	When you write the digits of a counting number in reverse order, you get a new number that is the reversal of the original number. What is the greatest common factor of 2010 and its reversal?
21	The five counting numbers $13, 5, 7, x$, and y have no common factor greater than 1. Their average is 11. If $x > y$ and $y \neq 1$, what is the value of $x - y$?
22	A unit fraction is a common fraction with 1 in the numerator. Alice is thinking of a unit fraction that is less than $\frac{2}{5}$. Bob is thinking of a unit fraction that is greater than $\frac{1}{10}$. What is the sum of the largest possible value of Alice's fraction and the smallest possible value of Bob's fraction?
23	Integers a and b are chosen at random from the set {1, 2, 3, 4, 5}, with replacement (that is, a and b are not necessarily different). As a reduced fraction, what is the probability that the sum of $9^a + 9^b$ will have 0 as its units (one's place) digit?
24	Patrick and Patsy are jogging in the same direction along the same straight track. Patrick has a head start of 36 miles and jogs at 4 miles per hour. Patsy jogs at a rate that is 175% of Patrick's rate. Assuming they maintain these speeds without stopping, how many hours will it take Patsy to catch up with Patrick?
25	In the figure at right, the three circles are congruent and tangent to each other. If the length of the circumscribing rectangle is 24 inches as shown, find the total number of square inches in the area that is inside the rectangle but outside the circles. Answer in exact form. 24 inches
26	In a "snow to shore" relay race, a canoeist covered her 12-mile portion of the route at an average speed of 5 miles per hour, and then passed the baton to a bicyclist who rode his 18 miles at 15 miles per hour. How many hours did it take them to cover these 30 miles? If your answer is not a whole number of hours, express it as a mixed number.
27	A square has area S^2 square inches. Each side of the square is lengthened by 4 inches. The perimeter of the new square is $A \times S + B$ inches. What is the sum of $A + B$ that will be true for all positive values of S?
28	In the figure at right (not drawn to scale), $\frac{y}{z} = \frac{1}{2}$. The area of triangle ABD is what fraction of the area of triangle ABC?
29	Each side of a triangle is a different positive multiple of 3. What is the number of units in the smallest possible perimeter of this triangle?
30	In 1960, Air Force Captain Joe Kittinger jumped from a balloon at 102,800 feet high to set the world's record for a high-altitude parachute jump. To the nearest whole mile, how many miles up was Capt. Kittinger when he jumped?

Challenge Questions

31	What is my number if 17 more than my number is the same as 71 minus twice my number?
32	Put the following four values in order of increasing size (smallest first). Your answer should consist of 4 letters in the correct order. $A = \dfrac{1}{7} + \dfrac{1}{9}$ $B = \dfrac{1}{4}$ $C = \dfrac{1}{8} + \dfrac{1}{6}$ $D = \dfrac{2}{7}$
33	Harshini and Miya are making cookies from a recipe that calls for mixing 2 cups of butter with $1\dfrac{1}{2}$ cups each of flour and sugar. However, they mistakenly read the quantities of flour and sugar as $\dfrac{11}{2}$ cups each, so this is what they mixed up. How many <u>additional</u> cups of butter will they need to add to keep the proportions the same as in the original recipe? If your answer is not a whole number, express it as a mixed number.
34	A bag contains seven red chips and six blue chips. Ben takes chips out of the bag one by one, at random and without replacement. Ben stops when he has removed all the red chips or all the blue chips. What is the probability that the last chip Ben removes is blue?
35	Sarah had a set of 100 square tiles, all the same size. She has now lost N of those tiles. It is now no longer possible for Sarah to lay out a set of squares made from her tiles so that all squares are different sizes and no tiles are left over. What is the smallest possible value of N?
36	When a certain counting number is divided by 7, the sum of the remainder and the quotient is 12. What is the sum of all possible values of this number? (Remember that the divisor must be larger than the remainder.)
37	Alan rakes leaves at a rate (in square yards of lawn area per hour) that is half Bill's rate, twice Charlie's rate, and 3 times Dan's rate. Charlie has twice as much area to rake as Dan, and half as much area to rake as Bill. Alan has $1\dfrac{2}{3}$ times as much area to rake as Charlie. Put the 4 initials A, B, C, D in increasing order of the amount of time it would take the four boys to finish raking leaves, using the $<$ (less than) symbol between letters. (If two or more boys took the same amount of time, separate their letters, listed in any order, by a comma. For example, $X, Z < Y$ means that X and Z took the same amount of time, which was less time than it took Y.)
38	Jan built a cube from unit cubes (each 1 by 1 by 1 unit). Ken took this cube apart, and used the unit cubes to build a rectangular solid that was the same height as Jan's cube but 2 units greater in width and 2 units less in length. Ken had 24 unit cubes left over. How many unit cubes did Ken use to build his figure?
39	As a joke, Jake put 4 boiled eggs in a carton. The other 8 eggs in the carton were raw. Jake's mom took 2 eggs from the carton at random to make pancakes. At least one of these eggs was boiled. As a fraction, what is the probability that both eggs she took were boiled?
40	Wendy has a piece of blue paper in the shape of a quarter-circle, with radius 5 inches, on which she is pasting square stamps 1 inch on a side. What is the largest number of stamps Wendy can paste entirely on the blue paper, without overlapping?

6th Grade

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Team Multiple Choice Contest

It is dam-building season on the Duwamish River! During the month of August, beavers from all over are swarming to the river to build their beaver dams and play their beaver games. Brad Beaver took these notes:

Materials	Weight (lb per item)	Total Items Available	Collection Time (minutes per item)	Underwater Strength (lb supported per item)
Branches	4	250	50	8
Logs	10	20	100	80
Clods of Mud	0.625	1000	??	0
Rocks	3	500	80	5

1	Given the data above, how many hours would it take Bonnie Beaver to collect 4 branches and 40 pounds of logs? A) $\frac{21}{2}$ B) 5 C) 10 D) 8 E) Answer Not Given
2	Bo Beaver is carrying her materials across the river. Bo can only carry 12 pounds of material per load. If she has 3 branches, 2 logs, and 15 rocks to carry, then what is the least number of loads she would need to carry all of her stuff across the Duwamish? A) 6 B) 5 C) 7 D) 10 E) Answer Not Given
3	Belinda Beaver is using 3 logs to provide underwater support for her dam. If she used only branches or only rocks instead, how many more rocks than branches would she need to provide the same amount of support as she gets from her logs? A) 30 B) 18 C) 45 D) 27 E) Answer Not Given
4	The twins, Bobby and Benny Beaver, are paddle-racing on logs down 1000 yards of the Duwamish. If they start at the same time and if Bobby travels at 5 feet per second while Benny travels at 8 feet per second, then how many minutes will Benny have to wait at the end for Bobby to finish? A) $\frac{5}{4}$ B) 4 C) $\frac{50}{9}$ D) $\frac{15}{4}$ E) Answer Not Given
5	Baby Billie Beaver is practicing dam-building by constructing rectangles on the riverbank with her branches. She builds a rectangle with a perimeter of 68 feet. All of its sides are integer numbers of feet long. What is the positive difference, in square feet, between the largest possible area and the smallest possible area of Billie's rectangle? A) 256 B) 225 C) 289 D) 196 E) Answer Not Given

Problem Restated:

It is dam-building season on the Duwamish River! During the month of August, beavers from all over are swarming to the river to build their beaver dams and play their beaver games. Brad Beaver took these notes:

Materials	Weight (lb per item)	Total Items Available	Collection Time (minutes per item)	Underwater Strength (lb supported per item)
Branches	4	250	50	8
Logs	10	20	100	80
Clods of Mud	0.625	1000	??	0
Rocks	3	500	80	5

6	Bella and Becky Beaver are playing a game where players alternate, each player on her turn picking up and removing either 1 rock or 2 rocks from a pile. A player wins if she pick up the last rock. They start with a pile of 6 rocks. If Bella goes first and each player plays the best possible strategy, then who is sure to win? A) Bella B) Becky C) Neither is sure to win; either might D) Not enough information to tell E)Answer Not Given
7	Bernie Beaver spent 13 hours collecting logs and rocks for his dam. If he collected a total of 48 pounds of material, how many rocks did he collect? A) 3 B) 6 C) 7 D) 10 E) Answer Not Given
8	Betty Beaver only collects branches on prime numbered days. On those days, she always collects the same number of branches as the date. (For instance, on the third day of the month she would collect 3 branches.) If Betty followed this plan for the entire month of August, how many branches were left for other beavers? A) 85 B) 101 C) 91 D) 190 E) Answer Not Given
9	Bertrand Beaver is collecting clods of mud. (He knows they don't make a very good dam, but he has ambitions as a riverbank sculptor.) He collected 455 pounds of mud, working around the clock for 9 days, 2 hours, and 24 minutes to do it. On average, how many minutes (rounded to the nearest whole minute) did it take Bertrand to collect each clod of mud? A) 18 B) 9 C) 54 D) 29 E) Answer Not Given

6th Grade

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Team Contest

1	What is the smallest whole number that could be subtracted from 2010 to produce a result less than 973?
2	Wendy lost a dollar but then found an amount equal to half the amount of money she had before losing her dollar. She now has $7.76. How much money (in dollars) did Wendy have originally?
3	An ant crawled forward 29 units along a number line from point A to point B. Then the ant turned and crawled back along the line, and ended up 8 units from point A. How many units was the ant from point B? Give all possible answers.
4	Suman drives 48 miles in 2 hours. At this speed, how many miles would Suman drive in 3 hours?
5	If the table at right continues with the pattern shown, what letter will head the column in which the number 2010 will appear?
6	Amazingly, 3-toed sloths have 3 toes per foot, and 2-toed sloths have 2 toes per foot. Each sloth has four feet. A group of 3-toed sloths and 2-toed sloths has 76 toes altogether. How many 3-toed sloths could be in the group? Give all possible answers.
7	A rectangle is cut in half to form 2 smaller rectangles. The perimeter of each of the smaller rectangles is 12 inches, and all of their sides are a whole number of inches. Find the sum of all numbers that could possibly be the perimeter (in inches) of the original rectangle.
8	Dotty puts a decimal point in each of the following two addends (without putting in extra zeros) such that S is greater than 10 but less than 100. Find the sum of all possible values of S that could result. $984 + 695 = S$
9	Put the following four values in order of increasing size (smallest first). Your answer should consist of 4 letters in the correct order. A = $\frac{17}{40}$ B = 40% C = $\frac{9}{22}$ D = $\frac{7.5}{19}$
10	I am thinking of a 3-digit whole number with all its digits different. Exactly one of its digits is in the number of inches in a yard. Exactly one of its digits is in the number of hours in 2/3 of a day. Exactly one of its digits is in the number of years in 25 decades. Exactly one of its digits is in the number of ounces in 4 pounds. What is the smallest my number could be?

For question 5, the table:

A	B	C	D	E	F
4	3	2	1		
5	6	7	8	9	10
					11

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Relay Contest

RELAYS - 5 minutes per relay

*There is no talking during this event and you must always be facing forward. Person #1 will be given an answer sheet(s) and will need to fill out the top. The proctor will hand out a strip of paper to each person. These need to be face down on your desk until it is time for the relay to start. Once the relay begins, everyone may turn over their strip of paper and begin working. You may write on the strip of paper to come up with your answer. However, when person #1 figures out his/her problem, he/she will record **just his/her final answer** on the answer sheet and pass only the answer sheet back to the person behind. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer from person #1, #2 and #3 is worth 1 point each. A correct answer from person #4 is worth 2 points making each relay worth 5 points. You will see the expression **TNYWG** [Proctor: write this on the board] which means: "the number you will get". This is where you put your teammate's answer that they pass back to you, and then you should be able to solve your question. Once the relay begins, turn over your strip of paper and **make sure you have the right person number**. Remember, no talking and remain facing forward to avoid being disqualified!*

	Relay #1	Answer
Person 1	Vishnu writes Math Is Cool problems at a constant (unchanging) rate. If he writes 4 problems in 10 minutes, how many problems would he write in 95 minutes?	38 [problems]
Person 2	Suman plays a game with his calculator where he inputs a two-digit number, reverses the digits, subtracts 25, divides by 2, finds the sum of the digits of this result, and finally subtracts 1. If his original number is TNYWG, what number does he end up with?	10
Person 3	Alex has TNYWG math problems in a homework assignment. Alex has an 80% chance of missing each assigned problem the first time he works it, but a 50% chance of correcting a mistaken answer when he checks his work. He never changes a correct answer when he checks it. After Alex checks and corrects his work, how many problems from this assignment can he expect to get wrong?	4 [problems]
Person 4	There are 20 lockers at Brahmagupta High School, numbered 1 through 20. All the lockers are closed. Ramanujan opens every locker whose number is a multiple of two, three, or five. He then closes all lockers whose numbers are multiples of TNYWG. After this process, how many lockers are closed?	11 [lockers]
	Relay #2	Answer
Person 1	Dr. Maybe has one thousand $300-dollar bills, but 23% of these bills are phony (counterfeit). How many dollars does Dr. Maybe have that are not phony?	[$]231,000
Person 2	Dr. Maybe pays each of his henchpeople $60 per day. They each work 7 days a week. If the total salary of his henchpeople is $TNYWG per week, how many henchpeople does he have?	550 [henchpeople]
Person 3	All of Dr. Maybe's TNYWG henchpeople are either Slightly Competent, Vaguely Perceptive, or both. If 197 henchpeople are Slightly Competent and 364 are Vaguely Perceptive, how many are both?	11 [henchpeople]
Person 4	Dr. Maybe sends a large group of henchpeople after Junk Bond. Nineteen fewer than 80% of them get lost, and then 4 more than 2/3 of the remainder fall off a cliff. After this, TNYWG henchpeople are left. How many henchpeople did Dr. Maybe send after Junk Bond?	130 [henchpeople]

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010

School Name_____Team #_____

Proctor Name_____Room #_____ Division: ____

Mental Math Contest

MENTAL MATH - 30 seconds per question

PERSON 1 NAME:		1 or 0
1.1	What is the median of the data set four, five, nine, five, nine, two?	5
1.2	What is the sum of the next three terms of an arithmetic series whose first three terms are sixteen, twenty-two, and twenty-eight?	120
1.3	What is the degree measure of the supplement of an angle measuring thirty-two degrees?	148 [° or degrees]
1.4	A unit cube is a cube with edge length one unit. How many more unit cubes will it take to make a cube six units on an edge than to make a cube five units on an edge?	91 [cubes]
PERSON 2 NAME:		
2.1	Convert eighty-eight percent to a reduced fraction.	22/25
2.2	Find the number of units in the perimeter of a right triangle with legs of six units and eight units.	24 [units]
2.3	Each row of tomatoes in Willie's garden requires seventy-five seeds to plant. How many complete rows can he plant with six hundred seventy-nine seeds?	9 [rows]
2.4	Joe has seven pennies, five quarters, two dimes, and three nickels. How much money does he have, as a decimal number of dollars?	[$] 1.67
PERSON 3 NAME:		
3.1	What is the total number of days in the five shortest months of a year that is not a Leap Year?	148 [days]
3.2	In how many ways can two identical blue chips and two identical red chips be arranged in a row?	6 [ways]
3.3	The sum of the interior angles of a certain regular polygon is five hundred forty degrees. How many diagonals can be drawn in this polygon?	5 [diagonals]
3.4	How many odd counting numbers are between twenty-eight and seventy-two?	22 [numbers]
PERSON 4 NAME:		
4.1	If today is Friday, what day of the week was it eighty-two days ago?	Sunday
4.2	What is the largest square number less than two hundred?	196
4.3	If three bales of hay weigh one hundred twenty pounds, how many pounds do five bales weigh?	200 [pounds]
4.4	Evaluate seventy-five percent of seven-thirds of eight.	14

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 1A
COLLEGE KNOWLEDGE BOWL ROUND #1

#	Problem	Answer
1	Alex, Sandy, and Chris wrote an average of one hundred sixteen math problems apiece. Chris wrote as many problems as Alex and Sandy put together. How many problems did Chris write?	174 [problems]
2	Express one hundred twenty-five percent as a reduced common fraction.	5/4
3	For every moisturized tissue, the manufacturers soak the fibers in ten MILLIGRAMS of lotion. If I buy a box of tissues that contains one hundred twenty-eight moisturized tissues, how many total GRAMS of lotion have my tissues soaked in? Answer as a decimal.	1.28 [grams]
4	How many whole numbers are factors of thirty-one?	2
5	I have two identical boxes of green tea, one box of black tea, and one box of herbal tea. If I don't want the two boxes of green tea to be together, how many ways can I arrange these four tea boxes in a row?	6 [ways]
6	If twice my favorite number plus nine is equal to six times my favorite number minus seven, then what is half my favorite number?	2
7	How many more zeros are needed to write the number two hundred fifty-nine million than to write the number one hundred four thousand?	2 [zeros]
	## Extra Problem – Only if Needed	
8	How many counting numbers greater than forty-nine but less than one hundred are divisible by six?	8 [numbers]

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 2A
COLLEGE KNOWLEDGE BOWL ROUND #2

#	Problem	Answer
1	A circular pie is divided evenly among eight people by cutting equal circular sectors. What is the degree measure of the central angle forming each slice?	45 [degrees]
2	Subtract the sum of five threes from the product of five threes.	228
3	Jenny has three red pens, two blue pens and one yellow pen. If she picks two pens at random, what is the probability that they are both blue? Answer as a reduced fraction.	$\frac{1}{15}$
4	On average, Molly eats two pizzas every week. At this rate, how many pizzas would she eat in January, February, and March of a Leap Year?	26 [pizzas]
5	How many ways are there to make exactly twenty cents using standard U.S. coins?	9 [ways]
6	What is the median of the positive integer factors of one thousand twenty-four?	32
7	A palindrome is a counting number that reads the same when its digits are reversed. How many three-digit palindromes are multiples of three if their middle digit is seven?	3 [palindromes]
	## Extra Problem – Only if Needed	
8	A rhombus has an area of fifty-four square units. One diagonal has length nine units. What is the number of units in the length of the other diagonal?	12 [units]

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 3A
COLLEGE KNOWLEDGE BOWL ROUND #3

#	Problem	Answer
1	What is the sum of the digits of the product of fifty-eight and seventy-four?	17
2	I drew a circle whose area in square inches is numerically the same as its circumference in inches. What is the number of inches in the radius of my circle?	2 [inches]
3	What is the largest counting number that can divide either forty-two or fifty-six, with no remainder in either case?	14
4	A fence is laid out with a fence post every two meters. How many fence posts are needed to fence in a regular pentagon with perimeter thirty meters?	15 [fence posts]
5	Nell has three fewer dollars than Gina. The sum of their money is forty-five dollars. How many dollars does Gina have?	24 [dollars]
6	What is the height of an isosceles trapezoid if the sum of the bases is thirty-four units and the area is fifty-one square units?	3 [units]
7	The sum of Keith's age and Fran's age is the largest prime number of years less than fifty. In years, what was the sum of their ages seven years ago?	33 [years]
	Extra Problem – Only if Needed	
8	What is the square of the product of seven times three?	441

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 1B

COLLEGE KNOWLEDGE BOWL ROUND #1

#	Problem	Answer
1	Rob eats five Goldfish crackers for every celery stick he eats. Each celery stick has peanut butter and three raisins on it. How many raisins has Rob eaten if he has eaten one hundred forty Goldfish crackers?	84 [raisins]
2	What is the sum of the first thirty odd counting numbers minus the sum of the first twenty odd counting numbers?	500
3	Lisa has seventy-four dollars. If Marie had eighteen more dollars, she would have the same amount of money as Lisa would have after spending an amount equal to the money that Marie now has. How many dollars does Marie have now?	[$] 28
4	Find the value of one-half of one-third of one-fourth of forty-eight.	2
5	There are many ways to arrange the letters in the word SWEET, spelled S-W-E-E-T. What fraction of these ways start OR end with the letter E?	7/10
6	Find the product of sixty-five times seventy-five.	4875
7	If I roll two fair cubical dice, the probability is one over thirty-six that the sum of the rolls is N. Give all possible values of N.	2, 12 [both required, either order]
	## Extra Problem – Only if Needed	
8	What is the perimeter, in inches, of a right triangle with legs of sixty inches and twenty-five inches?	150 [inches]

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 2B
COLLEGE KNOWLEDGE BOWL ROUND #2

#	Problem	Answer
1	Lynn has played half of her season's chess matches already, and has won thirty percent of them. What percent of her remaining matches must she win to end the season with forty-five percent wins?	60 [%]
2	The quotient of two counting numbers is three and their sum is twenty. What is the positive difference between the two numbers?	10
3	When the fraction eight billion over sixteen million is simplified and expressed in scientific notation, the result is X times ten to the Y power. What is X plus Y? If your answer is not an integer, give it as a decimal.	7
4	How many ones are needed to write the value of eleven raised to the third power?	2 [ones]
5	It takes Harry two hours to clean the cafeteria. It takes Jerry twice as long as Harry. At these rates, how many hours does it take both boys working together to clean the cafeteria? If your answer is not a whole number, give it as a mixed number of hours.	$1\frac{1}{3}$ [hours]
6	Circle A has a diameter of 20 inches. Circle B has an area one-fourth that of Circle A. Find the diameter in inches of Circle B.	10 [inches]
7	The sum of three consecutive counting numbers is sixty. What is the product of these three numbers?	7980
	## Extra Problem – Only if Needed	
8	What reduced fraction must be multiplied by one hundred twenty percent so that the product will be one?	5/6

"Math is Cool" Masters – 2009-10

6th Grade – May 22, 2010
Set 3B
COLLEGE KNOWLEDGE BOWL ROUND #3

#	Problem	Answer
1	What is the range of this set of numbers: three, zero, twenty-one, negative two, seven, and twenty-three?	25
2	Biff takes the number two thousand ten and halves it. Eho takes the number two thousand ten and doubles it. How much larger is Eho's result than Biff's result?	3015
3	An unfair coin lands on heads with a probability of two-thirds. If this coin is tossed twice, what is the probability, as a fraction, that it will land heads up exactly once?	4/9
4	Two years ago, my age in years was twice my age in years ten years ago. How many years old will I be two years from now?	20 [years]
5	My penny collection can be put into either twelve equal stacks or into ten equal stacks, with none left over in either case. What is the smallest number of pennies I could have in my collection?	60 [pennies]
6	The median of a collection of four counting numbers is two. If the average or mean of the four numbers is five, what is the largest possible value of any number of the collection?	15
7	I count backwards by fives, starting with fifty-four. What is the first prime number I will say?	29
	Extra Problem – Only if Needed	
8	A rectangle has an area of fifty-six square inches. It is four inches in width. How many inches greater is its length than its width?	10 [inches]

"Math is Cool" Masters – 2009-10
6th Grade – May 22, 2010

School Name_____Team #_____

Proctor Name_____Room #_____

STUDENT NAME_____Division: _____

Individual Contest – Score Sheet
DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0		Answer	1 or 0	1 or 0
1	0			21	8		
2	0 [lines]			22	4/9		
3	5			23	12/25		
4	5:39 PM			24	12 [hours]		
5	C [rectangle]			25	$192 - 48\pi$ [sq in]		
6	1700			26	$3\frac{3}{5}$ [hr]		
7	372 [days]			27	20		
8	34 [¢]			28	1/3		
9	6 [primes]			29	27 [units]		
10	1.864			30	19 [miles]		
11	8 [cm]			31	18		
12	9 [multiples]			32	BADC		
13	0, 4 [dimes] [either order]			33	$5\frac{1}{3}$ [cups]		
14	64 [cm^2]			34	7/13		
15	150 [°]			35	4 [tiles]		
16	72 [un^3]			36	462		
17	-50			37	$B < D < A < C$		
18	0.025 [L] or .025 [L]			38	192 [cubes]		
19	27 [burgers]			39	3/19		
20	6			40	15 [stamps]		

"Math is Cool" Masters – 2009-10
6th Grade – May 22, 2010

School Name_____Team #_____

Proctor Name_____Room #_____Division: _____

Team Multiple Choice Contest – Score Sheet

TEAM MULTIPLE CHOICE - 15 minutes
This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.

Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	C		
2	C		
3	B		
4	D		
5	A		
6	B		
7	B		
8	E [90]		
9	A		

"Math is Cool" Masters – 2009-10
6th Grade – May 22, 2010

School Name_____Team #_____

Proctor Name_____Room #_____Div: _____

Team Contest – Score Sheet

TEAM TEST - 15 minutes

When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as a 2 or 0.

DO NOT WRITE IN SHADED REGIONS

	Answer	2 or 0	2 or 0
1	1038		
2	[$] 5.84		
3	21, 37 [both required, either order]		
4	72 [miles]		
5	B		
6	1, 3, 5 [sloths] [any order]		
7	90 [inches]		
8	276.244		
9	DBCA		
10	267		

"Math is Cool" Masters -- 2009-10

6th Grade – May 22, 2010

School:_____Team #_____

Proctor: _____ Room #_____Div _____

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
38 [problems]	**10**	**4** [problems]	**11** [lockers]
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 2

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
[$] 231,000	**550** [henchpeople]	**11** [henchpeople]	**130** [henchpeople]
1 or 0	1 or 0	1 or 0	2 or 0